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## NOTICE OF ALLOWANCE AND FEE(S) DUE

7590

01/20/2011

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New York,, NY 10019-3775

EXAMINER

SHINGLETON, MICHAEL B

ART UNIT

PAPER NUMBER

2815

DATE MAILED: 01/20/2011

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/783,499	02/20/2004	George Gustave Zipfel JR.	ZIPFEL 1	7599

TITLE OF INVENTION: SWITCHING AMPLIFIER FOR DRIVING REACTIVE LOADS

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	YES	\$755	\$0	\$0	\$755	04/20/2011

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. **PROSECUTION ON THE MERITS IS CLOSED.** THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN **THREE MONTHS** FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. **THIS STATUTORY PERIOD CANNOT BE EXTENDED.** SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

## HOW TO REPLY TO THIS NOTICE:

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B. If the status above is to be removed, check box 5b on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above, or

If the SMALL ENTITY is shown as NO:

A. Pay TOTAL FEE(S) DUE shown above, or

B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check box 5a on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and 1/2 the ISSUE FEE shown above.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

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**INSTRUCTIONS:** This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

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7590 01/20/2011

Ronald D. Slusky  
 353 West 56th St.-Suite 5L  
 New York,, NY 10019-3775

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I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/783,499	02/20/2004	George Gustave Zipfel JR.	ZIPEEL 1	7599
TITLE OF INVENTION: SWITCHING AMPLIFIER FOR DRIVING REACTIVE LOADS				

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nonprovisional	YES	\$755	\$0	\$0	\$755	04/20/2011

EXAMINER	ART UNIT	CLASS-SUBCLASS
SHINGLETON, MICHAEL B	2815	330-010000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

- ☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.  
☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. Use of a **Customer Number is required.**

2. For printing on the patent front page, list

- (1) the names of up to 3 registered patent attorneys or agents OR, alternatively, 1 \_\_\_\_\_  
 (2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed. 2 \_\_\_\_\_  
 3 \_\_\_\_\_

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

(B) RESIDENCE: (CITY AND STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent): ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:

- ☐ Issue Fee  
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4b. Payment of Fee(s): (Please first reapply any previously paid issue fee shown above)

- ☐ A check is enclosed.  
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☐ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number \_\_\_\_\_ (enclose an extra copy of this form).

5. Change in Entity Status (from status indicated above)

- ☐ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27. ☐ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

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Authorized Signature \_\_\_\_\_

Date \_\_\_\_\_

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This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

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7590 01/20/2011			EXAMINER	
Ronald D. Slusky 353 West 56th St.-Suite 5L New York,, NY 10019-3775			SHINGLETON, MICHAEL B	
			ART UNIT	PAPER NUMBER

2815  
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## Determination of Patent Term Adjustment under 35 U.S.C. 154 (b) (application filed on or after May 29, 2000)

The Patent Term Adjustment to date is 0 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 0 day(s).

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (<http://pair.uspto.gov>).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

**Notice of Allowability****Application No.**

10/783,499

**Examiner**

Michael B. Shingleton

**Applicant(s)**

ZIPFEL ET AL.

**Art Unit**

2815

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--**

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to the amendment dated 08-04-2010.
2. ☒ The allowed claim(s) is/are 1, 3-33, 63-69 and 79.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some\* c) ☐ None of the:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.  
**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.  
(a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached  
1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.  
(b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.  
**Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).**
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO/SB/08),  
Paper No./Mail Date \_\_\_\_\_
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413),  
Paper No./Mail Date \_\_\_\_\_
7. ☒ Examiner's Amendment/Comment
8. ☐ Examiner's Statement of Reasons for Allowance
9. ☐ Other \_\_\_\_\_.

/Michael B Shingleton/  
Michael B Shingleton  
Primary Examiner  
Group art Unit 2815

Art Unit: 2815

Applicant in the amendment dated 8-4-2010 at least part of claim 16 is missing and claim 17-24 are entirely missing. The top part of the two papers has noted in writing that appears to be from the fax machine says that one page is 9/027 that has part of claim 16 and the next page noted as 010/027 starts with claim 25. Thus it is clear that if there was a missing page that this page was not received by the patent office and applicant may have lost the apparent page that had claim 16-24 thereon. But that said it is clearly apparent that applicant meant for these claims to be those as presented in the amendment of 12-14-2009. Claim 79 has been added as we have talked about previously.

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.

The following claims are hereby presented and replaces all previous versions:

CLAIMS

1. (Currently Amended) Apparatus comprising

at least first and second reactive loads,

a first circuit means that generates a first switching signal and includes switching elements with respective control terminals,

a second circuit means that generates a second switching signal and includes switching elements with respective control terminals,

means for generating a first PWM signal that includes a fundamental switching band signal component of the first switching signal and that further includes a baseband signal and for applying said first PWM signal to said control terminals of said first circuit means,

means for generating a second PWM signal that includes a fundamental switching band component of the second switching signal that has substantially the same magnitude and phase as the fundamental switching band component of said first PWM signal, and that further includes a baseband signal that is the inverse of said baseband signal that is included in the first PWM signal, and for applying said second PWM signal to said control terminals of said second circuit means,

means for generating first and second switching signals each having respective switching band components and at least one respective baseband component; and

means for applying said first and second switching signals to said first and second reactive loads, respectively;

wherein the means for generating functions so as to work with the means for applying to generate the switching signals in such a way that a) the sum of the values of the instantaneous currents through said each load is substantially zero; b) substantially all of said at least one baseband component of said first switching signal is a current that flows into said first reactive load and c) substantially all of said at least one baseband component of said second switching signal is a current that flows into said second reactive load;

wherein at least one of said reactive loads is a transducer capacitive load.

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2. ~~Canceled.~~

3. (Currently Amended) The invention of claim 1 wherein the first and second circuit means function so as to work with the means for generating a first PWM signal and with the means for generating a second PWM signal to generate the switching signals in such a way that a) the sum of the values of the instantaneous currents through said each load is substantially zero, b) substantially all of said at least one baseband component of said first switching signal is a current that flows into said first reactive load and c) substantially all of said at least one baseband component of said second switching signal is a current that flows into said second reactive load,

there are N of said loads and wherein for each of a number of signal variables for each load, the sum of the values of each particular signal variable is substantially constant.

4. (Currently Amended) The invention of claim 3 wherein there are N of said loads, wherein for each of a number of signal variables for each load, the sum of the values of each particular signal variable is substantially constant, and wherein said number of signal variables is greater than 1 and less than N.

5. (Currently Amended) The invention of claim 1 wherein respective first terminals of each of said reactive loads are connected to a common node through which said current at baseband frequencies flows, said common node being connected to a fixed potential.

6. (Currently Amended) The invention of claim 5 wherein each of said reactive loads has a second terminal and wherein said apparatus further comprises means for applying at least the baseband components of said first switching signal between the second terminal of said first reactive load and said common node and for applying at least the baseband components of said second switching signal between the second terminal of said second reactive load and said common node.

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1           7.       (Currently Amended) The invention of claim 1 further comprising a  
2       mechanical load connected to said ~~transducer~~capacitive load.

1           8.       (Original) The invention of claim 7 wherein said mechanical load  
2       includes means for generating acoustic sonar signals.

1           9.       (Currently Amended) The invention of claim 1  
2       ~~Apparatus comprising~~  
3       ~~at least first and second reactive loads;~~  
4       ~~means for generating at least first and second switching signals, each having~~  
5       ~~respective switching band components and at least one respective baseband component;~~  
6       ~~means for applying said first and second switching signals to said first and second~~  
7       ~~reactive loads, respectively;~~  
8       wherein the first and second circuit means function means for generating  
9       functions so as to work with the means for generating a first PWM signal and with the  
10       means for generating a second PWM signal applying to generate the switching signals in  
11       such a way as to cause a) substantially the same amount of current at baseband  
12       frequencies that flows out of one or more of said reactive loads at a given time to flow  
13       into one or more of the others of said reactive loads, b) substantially all of said at least  
14       one baseband component of said first switching signal to be a current that flows into said  
15       first reactive load and c) substantially all of said at least one baseband component of said  
16       second switching signal to be a current that flows into said second reactive load;  
17       wherein at least one of said reactive loads is a transducer.

1           10.       (Currently Amended) The invention of claim 9 further comprising  
2       means for connecting respective first terminals of each of said reactive loads to a  
3       common power supply node through which said current at baseband frequencies flows.

1           11.       (Currently Amended) The invention of claim 10 wherein each of said  
2       reactive loads has a second terminal and wherein said apparatus further comprises means  
3       for applying at least the baseband components of said first switching signal between the

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second terminal of said first reactive load and said common node and for applying at least the baseband components of said second switching signal between the second terminal of said second reactive load and said common node.

12. (Withdrawn-Currently Amended) The invention of claim 11 wherein said apparatus is further adapted to drive a third reactive load with a third switching signal, said third switching signal having switching band components and at least one baseband component, said third reactive load having a second terminal, and wherein said apparatus further comprises means for applying the at least one baseband component of said third switching signal between the second terminal of said third reactive load and said common node.

13. (Currently Amended) The invention of claim 9 wherein said reactive loads have substantially equal impedance and wherein said baseband components are the inverse of one another.

14. (Currently Amended) The invention of claim 9 wherein said apparatus further includes at least one power supply terminal and wherein said current flowing out of one or more of said reactive loads flows away from said power supply terminal and said current flowing into one or more of the others of said reactive loads flows toward said power supply terminal.

15. (Original) The invention of claim 14 wherein the phases and amplitudes of said baseband components are such that said currents add to zero at substantially all times.

16. (Currently Amended) The invention of claim 14 wherein respective first terminals of each of said reactive loads are connected to a common node through which said current at baseband frequencies flows, said common node being at a fixed potential.

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1           17.       (Original) The invention of claim 9 wherein there are two of said loads,  
2 wherein said two loads have substantially equal impedances and wherein the baseband  
3 components of said first and second switching signals are of substantially equal  
4 magnitude and are substantially the inverse of one another.

1           18.       (Withdrawn-Currently Amended) The invention of claim 9 wherein said  
2 switching ~~amplifier apparatus~~ is further adapted to drive a third reactive load with a third  
3 switching signal, wherein said first, second and third loads have substantially equal  
4 impedances and wherein the baseband components of said first, second and third  
5 switching signals are such that they add to zero at substantially all times.

1           19.       (Previously Presented) The invention of claim 9 further comprising a  
2 mechanical load connected to said transducer.

1           20.       (Original) The invention of claim 19 wherein said mechanical load  
2 includes means for generating acoustic sonar signals.

1           21.       (Previously Presented) The invention of claim 9 wherein said apparatus  
2 further includes at least first and second signal paths containing said first and second  
3 loads, respectively.

1           22.       (Original) The invention of claim 21 wherein alternating polarity  
2 currents flow in said first and second signal paths in response to said first and second  
3 switching signals, respectively.

1           23.       (Original) The invention of claim 22 wherein said first and second  
2 switching signals are generated in response to first and second pulse-width-modulated  
3 signals, respectively.

1           24.       (Previously Presented) The invention of claim 21 wherein said apparatus  
2 further includes means for applying said first and second switching signals to said first

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and second signal paths, respectively, in such a way that at least one switching band component of said first switching signal and at least one switching band component of said second switching signal cancel each other and therefore are substantially isolated from said reactive loads.

25. (Original) The invention of claim 24 wherein alternating polarity currents flow in said first signal path in response to said first switching signal and alternating polarity currents flow in said second signal path in response to said second switching signal.

26. (Previously Presented) The invention of claim 24 wherein said at least one switching band component of said first switching signal and said at least one switching band component of said second switching signal are the fundamental frequency components of said first and second switching signals, respectively, and are of substantially the same amplitude and phase, and said means for applying comprises a common-mode inductor in said first and second signal paths.

27. (Withdrawn-Currently Amended) The invention of claim 21 wherein said apparatus is further adapted to drive a third reactive load with a third switching signal, wherein said switching amplifier includes at least a third signal path containing said third reactive load, and wherein said apparatus further includes means for applying said first, second and third switching signals to said first, second and third signal paths, respectively, in such a way that at least one switching band component of each of said first, second and third switching signals cancel each other and therefore are substantially isolated from said reactive loads.

28. (Withdrawn) The invention of claim 27 wherein alternating polarity currents flow in said first signal path in response to said first switching signal, alternating polarity currents flow in said second signal path in response to said second switching

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4 signal, and alternating polarity currents flow in said third signal path in response to said  
5 third switching signal.

1  
2 29. (Withdrawn) The invention of claim 27 wherein  
3 said at least one switching band component of said first, second and third  
4 switching signals are of substantially the same amplitude and phase, and  
5 said means for applying comprises a common-mode inductor in said first, second  
6 and third signal paths.

1  
2 30. (Currently Amended) The invention of claim 21 wherein  
3 each of said reactive loads includes a first terminal and a second terminal,  
4 the first terminals of each of said reactive loads are connected to a common node  
5 through which said current at baseband frequencies flows, said common node being  
6 adapted to be connected to a fixed potential,  
7 each said path includes filtering circuitry connected to the second terminal of the  
8 respective reactive load, and  
9 each of said first and second switching signals comprises an alternating polarity  
10 signal impressed across said first and second signal paths, respectively.

1  
2 31. (Currently Amended) The invention of claim 21 wherein  
3 each of said reactive loads includes a first terminal and a second terminal,  
4 the first terminals of each of said reactive loads are connected to a common node  
5 through which said current at baseband frequencies flows, said common node being  
6 connected to a fixed potential,  
7 each said path includes filtering circuitry connected to the second terminal of the  
8 respective reactive load, and  
9 said first and second switching signals comprise respective signals at first and  
10 second potentials applied to the filtering circuitry of said first and second signal paths,  
11 respectively.

1  
2 32. (Currently Amended) The invention of claim 31 wherein

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2        said second potential is substantially equal to said fixed potential, and  
3        said filtering circuitry includes at least one energy storage element that stores  
4        energy when each said switching signal is at said first potential and that supplies energy  
5        to said ~~reactive~~ loads when each said second node is connected to said second potential.

1        33.        (Previously Presented) The invention of claim 32 wherein  
2        said energy storage element is a common-mode inductor having first and second  
3        ports in said first and second paths, respectively, and  
4        said first and second switching signals have respective fundamental switching  
5        band components that are of substantially equal magnitude and phase that are canceled by  
6        said common-mode inductor.

1        34 - 62.        Canceled.

1        63.        (Currently Amended) A switching amplifier operating at a particular  
2        switching frequency, the switching amplifier comprising  
3        at least first and second circuit paths,  
4        each of said paths comprising switching circuitry, a load filter, a respective port of  
5        a common-mode inductor and a transducer, all connected in series, each transducer  
6        having a terminal that is connected to a power supply node in common with each other  
7        transducer, each load filter having a passband that includes said particular switching  
8        frequency and having a stop band at frequencies higher than said particular switching  
9        frequency,

10        said switching circuitry being operative in response to a first pulse-width-  
11        modulated signal to cause first and second voltages of a first switching signal to be  
12        alternately impressed between the load filter of said first circuit path and said common  
13        node and being further operative in response to a second pulse-width-modulated signal to  
14        cause first and second voltages of a second switching signal to be alternately impressed  
15        between the load filter of said second circuit path and said common node,

16        said first and second switching signals having respective fundamental switching  
17        components that are of substantially equal magnitude and phase so that they are canceled

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18 by said common-mode inductor, said first and second switching signals each further  
19 having at least one respective baseband component, the baseband components of said  
20 first and second switching signals being such that substantially the same amount of  
21 current at baseband frequencies flowing out of one or more of said transducers at a given  
22 time flows into one or more of the others of said transducers, and  
23 substantially all of said at least one baseband component of said first switching  
24 signal being a current that flows into one of said transducers and substantially all of said  
25 at least one baseband component of said second switching signal being a current that  
26 flows into another of said transducers.

1

1 64. (Original) The invention of claim 63 wherein the phases and amplitudes  
2 of said baseband components are such that said currents add to zero at substantially all  
3 times.

1

1 65. (Previously Presented) The invention of claim 63 wherein said  
2 transducers have substantially equal impedance and wherein said baseband components  
3 are the inverse of one another.

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1 66. (Previously Presented) The invention of claim 63 wherein said switching  
2 amplifier includes at least one power supply terminal and wherein said current flowing  
3 out of one or more of said transducers flows away from said power supply terminal and  
4 said current flowing into one or more of the others of said transducers flows toward said  
5 power supply terminal.

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1 67. (Previously Presented) The invention of claim 63 wherein there are two  
2 of said transducers having substantially equal impedances and wherein the baseband  
3 components of said first and second switching signals are of substantially equal  
4 magnitude and are substantially the inverse of one another.

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1 68. (Previously Presented) The invention of claim 67 wherein a mechanical  
2 load is connected to at least one of said transducers.

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1           69.     (Original) The invention of claim 68 wherein said mechanical load  
2     includes means for generating acoustic sonar signals.

70 - 78. Canceled

79. Apparatus comprising:

N reactive loads, wherein N greater than or equals to 2, N circuit means each of which generates a respective switching signal and includes switching elements with respective control terminals, N PWM generating means each for generating a respective PWM signal and for applying said respective PWM signal to said control terminals of a respective one of said circuit means, wherein each PWM signal includes a) a fundamental switching band signal component of a respective one of the switching signals, wherein the fundamental switching band signal components all have substantially the same magnitude and phase as one another and b) a baseband signal, wherein the baseband signals of the PWM signals add to zero at substantially all times, and wherein at least one of said reactive loads is a capacitive load.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael B. Shingleton whose telephone number is (571) 272-1770.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ken Parker, can be reached on (571) 272-2298. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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A handwritten signature in cursive script that reads "Michael B. Shingleton". The signature is written in dark ink and is positioned above the typed name in the bottom right section of the page.

MBS

December 18, 2010

/Michael B. Shingleton/  
Michael B Shingleton  
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